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- Naor,Simeon  
Tel-Aviv,69122(US)

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(74) Representative: Moss,Robert Douglas  
IBMUnitedKingdomLimited  
IntellectualPropertyDepartment  
HursleyPark  
WinchesterHampshireSO212JN(GB)

(71) Applicant: InternationalBusinessMachines  
Corporation  
Armonk,N.Y.10504(US)

(72) Inventors:

- Dwork,Cynthia  
PaloAlto,California94301(US)

### (54) Systemandmethodformessageauthenticationinanon-malleablepublic-keycryptosystem

(57) A method is provided for authentication of encrypted messages (M). A non-malleable public-key encryption technique is employed, so that an eavesdropper (B) cannot employ an encrypted message (M), previously overheard, to generate a message which, when sent to a recipient (R), which would pass a message originating from a valid sender (S). In a preferred embodiment, a protocol is provided in which, in response to a message authentication request (req) from a sender (S), a recipient (R) sends the sender (S) a string (st), encrypted according to the sender's non-malleable public key (Es). The sender (S) decrypts the string using its private key, and sends the recipient (R) a message (Auth(M, ST)) which is a function (Auth) of the string (St) and the message (M) to be authenticated. Because of the non-malleability of the public keys, an eavesdropper (B) cannot impersonate the sender (S) or the recipient (R) and produce a disinformation message which would nevertheless contain the correct authorization string.

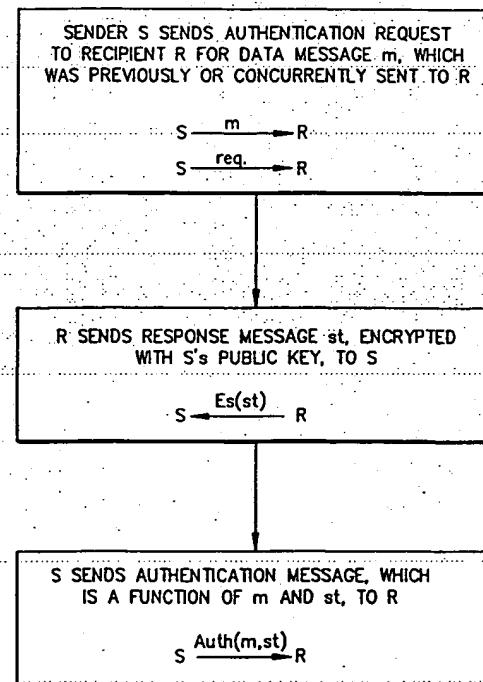


FIG. 2

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## EUROPEAN SEARCH REPORT

Application Number

EP 94 30 9658

DOCUMENTS CONSIDERED TO BE RELEVANT		Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)		
Category	Citation of document with indication, where appropriate, of relevant passages				
X	<p>EP 0 522 473 A (MITSUBISHI ELECTRIC CORP) 13 January 1993 (1993-01-13)</p> <ul style="list-style-type: none"> <li>* abstract *</li> <li>* column 1, line 50 - column 2, line 20 *</li> <li>* column 4, line 52 - column 7, line 2 *</li> <li>* claim 1 *</li> <li>* figures 2,4 *</li> </ul>	1,2,4,5	H04L9/32 H04L9/30		
A	<p>SIMMONS G J: "A PROTOCOL TO PROVIDE VERIFIABLE PROOF OF IDENTITY AND UNFORGEABLE TRANSACTION RECEIPTS" IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS, US, IEEE INC, NEW YORK, vol. 7, no. 4, page 435-447 XP000007982 ISSN: 0733-8716</p> <ul style="list-style-type: none"> <li>* abstract *</li> <li>* page 436, right-hand column, line 6 - line 20 *</li> <li>* page 437, right-hand column, line 3 - line 33 *</li> <li>* page 439, right-hand column, line 22 - page 442, right-hand column, line 47 *</li> </ul>	1-6			
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TECHNICAL FIELDS SEARCHED (Int.Cl.6)					
H04L					
The present search report has been drawn up for all claims					
Place of search	Date of completion of the search	Examiner			
THE HAGUE	10 January 2000	Gautier, L			
CATEGORY OF CITED DOCUMENTS					
<p>X : particularly relevant if taken alone  Y : particularly relevant if combined with another document of the same category  A : technological background  O : non-written disclosure  P : intermediate document</p> <p>T : theory or principle underlying the invention  E : earlier patent document, but published on, or after the filing date  D : document cited in the application  L : document cited for other reasons  &amp; : member of the same patent family, corresponding document</p>					

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ON EUROPEAN PATENT APPLICATION NO.**

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10-01-2000

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